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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/211,718	12/14/1998	ERIC R. FOSSUM	08305/015001	9540

20985 7590 11/06/2002

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EXAMINER
GENCO, BRIAN C

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/211,718	FOSSUM ET AL.	
	Examiner	Art Unit	
	Brian C Genco	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-8 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-8 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Examiner's Notes

Examiner notes that figure 3 was not submitted with the application.

On page 4, line 5 the phrase "order of um" needs some sort of qualitative value for the sentence to be grammatically correct.

On page 4, line 18 examiner notes that there is no element 200 in figure 2.

On page 4, line 20 examiner notes that there is no element 210 in figure 2

On page 5, lines 4-6 examiner notes that this sentence is not grammatically correct.

On page 5, lines 11-23 there is no figure 3 as noted above therefore there are no elements 300, 302, 304, 306, 310, and 312 illustrated in figure 3.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In regards to claim 1 examiner notes that the claimed "no circuitry being located between said image sensor and any of said first, second or third edges" does not follow with the invention described in the specification. Namely, with the row circuitry being in the middle of the image sensor there is circuitry located between the left half of the image sensor and the second edge, as

well as the right hand side of the image sensor and the first edge or in more general terms there is circuitry between the image sensor and the first and second edges.

In regards to claims 2-7 these claims all are dependent upon claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 5,510,623 to Sayag et al) in view of (USPN 6,115,066 to Gowda et al).

In regards to claim 1 Sayag et al, herein Sayag, discloses, "Fig. 1 also illustrates a substrate or carrier 12 on which the Si CCD area array 10*a* is mounted (column 4, lines 6-7, Sayag)." Sayag further discloses, "In accordance with an aspect of this invention the CCD read-out structure is disposed at an interior region of the array, in this case in the center (read-out register 10b), as opposed to along edges that extend to rectangular corners of the array (column 4, lines 31-36, Sayag)." Sayag further discloses, "The preamp 10c converts a magnitude of a

charge packet to a corresponding voltage potential (column 4, lines 16-18, Sayag)," or in other words the preamp is "chip logic associated with parts of said image sensor other than said rows individually." Sayag does not disclose that the image sensor be a CMOS image sensor, instead Sayag discloses that the image sensor be a CCD.

Gowda et al, herein Gowda, discloses "CMOS imagers are inherently lower cost than conventional charge coupled devices (CCDs) because they can be manufactured in conventional, widespread CMOS fabrication lines without any process modification (column 1, lines 37-41, Gowda)." Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have mad Sayag's CCD image sensor a CMOS image sensor in order to reduce cost.

In regards to claim 2 Sayag discloses an embodiment in column 6, lines 6-15 wherein the "row logic is formed in place of two columns of the array."

In regards to claim 3 reference figure 1. Note that as stated above the read-out circuit in Sayag's invention is "approximately the same size as the pixels (column 2, lines 58-59, Sayag)" wherein as seen in figure 1 the active sense area comes to within approximately two pixels, or "two pixel pitches of first, second, and third edges of the chip."

In regards to claim 4 see examiners notes on the rejection of claim 3. Note figure 1.

In regards to claim 5 it is very well known and established in the art to interpolate missing or dead pixels. In regards to the problem of obtaining image data for the area taken up by the read-out column Sayag discloses that the central read-out register be made of photosensitive material, wherein "the photosensitive pixels of the center read-out register 10b are then read out, processed, and stored ... If time permits, the center read-out register pixels can be

read out and stored one or more additional times (column 6, line 63 – column 7, line 1, Sayag)." Sayag further discloses, "The presently preferred layout of the read-out register 10b requires the bus for the read-out register 10b to be located on top of itself. Therefore this register, although optically active, will have a reduced sensitivity. This forms a narrow 'dead' line in the image which can be corrected for in the final image processing software (column 7, lines 41-46, Sayag)." Sayag still further discloses, "any accumulated charge read out of the center read-out register 10b during the exposure, either for exposure optimization and/or exposure termination detection, is preferably saved and subsequently used to complete the image within the central stripe occupied by the read-out register (column 8, lines 13-17, Sayag)." Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have done some sort of interpolation in order to produce a final image without a "dead" line in the center of the image.

In regards to claim 6 Sayag discloses, "In accordance with an aspect of this invention the CCD read-out structure is disposed at an interior region of the array, in this case in the center (column 4, lines 31-33, Sayag)."

In regards to claim 7 see examiners notes on the rejection of claim 1. Note that the substrate (element 12 of figure 1) serves as a "guard ring." Also note figure 1.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 5,510,623 to Sayag et al) in view of (USPN 6,115,066 to Gowda et al) in further view of (USPN 5,321,303 to Kawahara et al) in still further view of (USPN 5,629,524 to Stettner et al).

In regards to claim 8 see examiners notes on the rejection of claim 1. Note that Sayag's invention is for use in dentistry and does not disclose to use it in a large format image sensor.

Kawahara et al, herein Kawahara, discloses, "the higher the resolving power, the smaller the distance between each pair of adjacent sensors (column 1, line 67 – column 2, line 1, Sayag)." Note that the Kawahara invention "pertains to a semiconductor device constituted by a plurality of semiconductor chips connected together with a high degree of accuracy (column 1, lines 13-16, Stettner)," such as a large format image sensor.

Stettner et al, herein Stettner, discloses, "To reduce the exposed inactive hybrid area resulting from the peripheral circuitry 9 on the readout array chips 8 (FIG. 2), the active area of an upper hybrid covers the inactive area of a lower hybrid (column 6, lines 60-63, Stettner)." As shown in figure 2 Stettner teaches to combine a plurality of image sensors to form a large format image sensor.

Applying Stettner's teachings to the Sayag invention it would have been obvious to one of ordinary skill in the art at the time of the invention to have butted Sayag's image sensors together to form a large format image sensor without the need to complicate the combination by not having to overlap portions of the image sensors as disclosed by Stettner since there is no circuitry on the periphery of Sayag's image sensors and thus the limitation of reducing the distance between sensors as disclosed by Kawahara is met.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(USPN 5,886,353 to Spivey et al)

(USPN 6,307,393 B1 to Shimura)

(USPN 6,456,324 B1 to Yamada et al)

(USPN 5,398,275 to Catalin)

(USPN 5,990,503 to Ingram et al)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian C. Genco who can be reached at 703-305-7881. The examiner can normally be reached on Monday thru Friday 8:00am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center 2600 customer service office whose telephone number is 703-306-0377.

Brian C Genco
Examiner
Art Unit 2615

October 29, 2002

ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600